

U.S. PTO Customer No. 25280

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Amendments to the Claims

From claim 1, the resistive value range limitation has been deleted and a new limitation of the core comprising nonconductive multifilaments or staple fibers has been added and the spelling of "coefficient" has been corrected. The word "yarn" was added to the core. Justification for the changes may be found on page 3, lines 3, and lines 15-18. New claims 9-12 add limitations on the PTCR sheath. Claim 9 claims that the sheath comprises a polymer selected from the group consisting of polyethylene, halo-derivatives of polyethylene, ethylene ethylacrylate, and polyolefin. (Justification page 4, lines 11-16). Claim 10 claims that the PTCR sheath is cross-linked. (Justification page 4, lines 27-29). Claim 11 adds the limitation that the PTCR sheath comprises a thermoset polymer. (page 4, lines 13-16). New claim 12 claims that the PTCR sheath will cut off conductivity of the PTCR sheath at a selected temperature. (Justification page 5, lines 1-4).

Remarks

The Office Action dated July 15, 2005, included the following rejections, objections, and comments:

1. Claims 1-8 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 9-31 of co-pending application number 10/424,120.
2. Claims 1-8 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-12 of U.S. Patent Number 6,720,531.
3. Claims 1-9 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.
4. Claims 1-9 were rejected under 35 USC § 103(a) as being unpatentable over U.S. 4,061,827 (Gould).

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In response to these rejections, objections, and comments, and in view of the above Amendments, Applicant provides the following Remarks:

1. **Provisional Rejection of Claims 1-8 Over Co-Pending Application Number 10/424,120.**

Claims 9-12 were provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 9-31 of copending application number 10/424,120. In view of the provisional nature of the rejection, Applicant respectfully submits that it is premature to submit a Terminal Disclaimer. However, when all other issues have been resolved, Applicant will submit the appropriate Terminal Disclaimers.

2. **Provisional Rejection of Claims 1-8 as an Obvious-Type Patenting Over U.S. 6,720,539.**

Claims 9-12 were provisionally rejected under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 1-12 of U.S. Patent Number 6,720,539. In view of the provisional nature of the rejection, Applicant respectfully submits that it is premature to submit a Terminal Disclaimer. However, when all other issues have been resolved, Applicant will submit the appropriate Terminal Disclaimers.

3. **Claims 1-8 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.**

Claims 1-9 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. However, Applicant has deleted the resistance value range from these claims. Therefore, Applicant respectfully submits that the rejection has become moot.

4. **Claims 1-8 were rejected under 35 USC § 103(a) as being unpatentable over U.S. 4,061,827 (Gould).**

Claim 1 has been modified to eliminate the resistance value limitation and add the limitation that the core yarn of the PTC yarn is a multifilament or staple fiber yarn. Gould does not teach, suggest, or disclose the use of non-conductive multifilaments or staple fibers surrounded by a conductive sheath. Gould discloses embedding carbon to

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create conductive fibers with monofilaments as the core of the fibers and embedding the carbon into fabrics and bundles of fibers.

*"The process may be used for treating a single fibre, or for treating a bundle of fibres which may be in the form of a yarn, roving, or knitted, woven, or non-woven fabric." (Col 3 lines 12-15)*

When the process of Gould is applied to a bundle of fibers or on a piece of fabric (as in example 1), all of the fibers of the bundle of fabric are subjected to the conductive treatment and become conductive. Therefore, the resulting yarn is a bundle of filaments, each of which is an individually conductive monofilament. In the Applicant's process the conductive sheath is formed from thermoplastic and conductive particles, and then applied to the multifilament core. Therefore, where a multifilament or staple fiber is used as the core of the yarn, the multifilaments and staple fibers remain non-conductive surrounded by a conductive sheath. Gould yields a bundle of conductive yarn while the invention is a non-conductive multifilament core yarn surrounded by a conductive sheath. Having multifilaments or staple fibers that are nonconductive surrounded by a conductive material preferred for some applications.

New claims directed towards the sheath comprising polyethylene, halo-derivatives of polyethylene, ethylene ethylacrylate, and polyolefin, the sheath being cross-linked, and the sheath comprising a thermoset polymer have been added. Gould discloses the use of "thermoplastic organic polymers such as for example, polyesters, including polyethylene terephthalate, polyamides, including nylon-6 and nylon-66, polyacrylonitrile and modified polyacrylonitrile." (Col 1 lines 10-13). Gould is silent on the use of polyethylenes as the sheath material, polyethylenes being preferred because of their high thermal expansion coefficient. Furthermore, Gould does not teach, suggest, or disclose the use of cross-linked or a thermoset sheath material.

Additionally, a claim has been submitted with the limitation that the PTCR sheath will cut off conductivity of the PTCR sheath at a selected temperature. In this embodiment, the TELC matrix can be left to soften at a specific temperature to provide a built-in "fuse" that will cut off conductivity of the TELC matrix at the location of the selected temperature (specification page 5, lines 1-4). The Applicants respectfully submit that the claims as submitted are distinct over Gould and therefore are allowable.

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Applicant respectfully submits that the laying of a PTC yarn in a knit structure is not obvious in view of Gould. Although Gould may indicate that a PTC fiber can be used in a knit material, there is no teaching, suggestion, or motive to specifically lay that yarn within the loops of a knit material. Therefore, Applicant respectfully submits that the claimed invention is not obvious over Gould.

In view of the forgoing amendments and remarks, the Examiner is respectfully requested to withdraw the outstanding rejection and to pass the subject application to Allowance. In the event that the Examiner believes that the claims would be allowable with minor changes, the Examiner is invited to telephone the undersigned to discuss an Examiner's Amendment.

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Respectfully submitted,

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